The Learning Enterprise is Now Open

Session 611 Enterprise IT

These are confidential sessions—please refrain from filming or taking pictures.

Enterprise IT

The Learning Enterprise is Now Open

The Sakai Project and The Open Knowledge Initiative

Charles Severance, Chief Architect
of Sakai, University of Michigan

Jeff Merriman, Project Director
Chuck Shubert, SW Architect
Geoff Hulette, SW Engineer
MIT

Sakai

Dr. Charles Severance

http://developer.apple.com/wwdc2005/

What is Sakai?

- A project—an initial grant for two years
- A community—an emerging group of people and resources supporting the code and each other, realizing large scale Open Source efficiencies in Higher Ed
- An extensible framework for building collaborative—provides basic capabilities to support a wide range of tools and services—teaching and research
- A product with
  - A *released bundle* of the framework and
  - A *set of* tools—written and supported by various groups and individuals—which have been tested and released as a unit

Why You Should Care

- Education institutions and customers
  - Deploy on Mac OS X Server, Xserve
  - Extensibility enables innovation faculty and staff
  - Keep control of the software used for teaching, learning, and collaboration
- Commercial and Open/Community Source Developers
  - Integrate your own code, widget to create Mac OS X, QT/MPEG workflows
  - Provide consulting, technical support, local integration, etc.
- Content Providers
  - Allows entry to campuses which formerly build their own learning management systems
  - Provides opportunity to affect standards used by BlackBoard and WebCT

The Sakai Project

Funding and Initial Institutional Partners

http://developer.apple.com/wwdc2005/

The Sakai Project

The University of Michigan, Indiana University, MIT, Stanford, the uPortal Consortium, and the Open Knowledge Initiative (OKI) are joining forces to integrate and synchronize their considerable educational software into a pre-integrated collection of open source tools.

Sakai Project receives $2.4 million grant from Mellon

Sakai Funding

- Each of the 4 core Universities commits
  - 5+ developers/architects, etc. under Sakai Board project direction for 2 years
  - Public commitment to implement Sakai
  - Open/Open licensing—"Community Source"
- So, overall project levels
  - $4.4M in institutional staff (27 FTE)
  - $2.4M Mellon, $300K Hewlett
  - Additional investment through partners

THE CHRONICLE OF HIGHER EDUCATION

Today's News

Thursday, January 22, 2004

4 Colleges Collaborate on Open-Source Courseware

By ANDREA L. FOSTER

In what may be a big threat to commercial providers of course-management systems, four universities have announced a $6.8-million collaborative venture to create open-source courseware tools and related software for higher-education institutions.

The universities developing the system, called the Sakai Project, are the Indiana University system, the Massachusetts Institute of Technology, Stanford University, and the University of Michigan at Ann Arbor, which will lead the effort.

HEADLINES

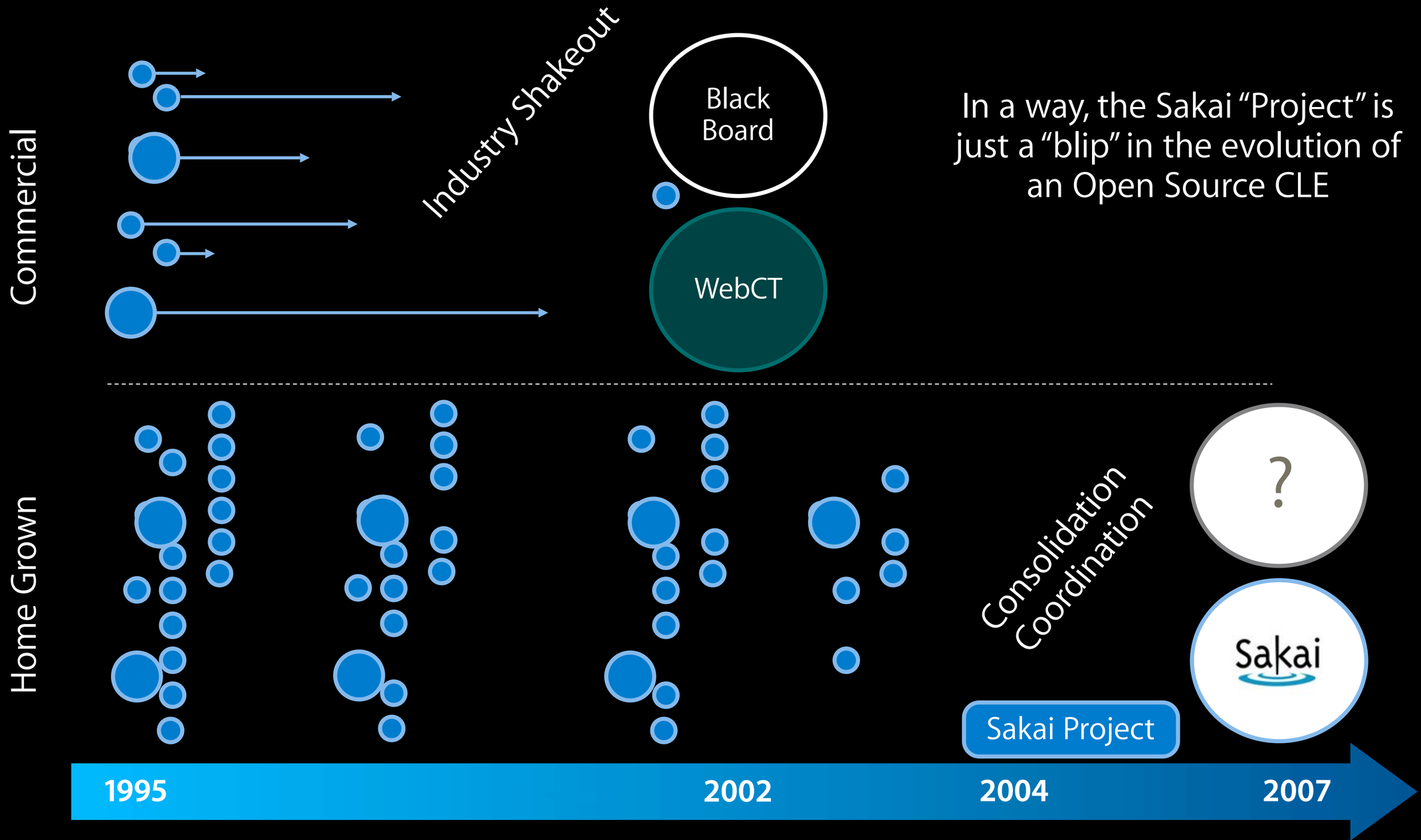
Bush proposes $250-million job-training program in visits to community colleges

U. of Pennsylvania to name Amy Gutmann of Princeton as its new president

Record companies sue 532 computer users, accusing them of illegally sharing songs

4 colleges collaborate on open-source courseware

Consolidation



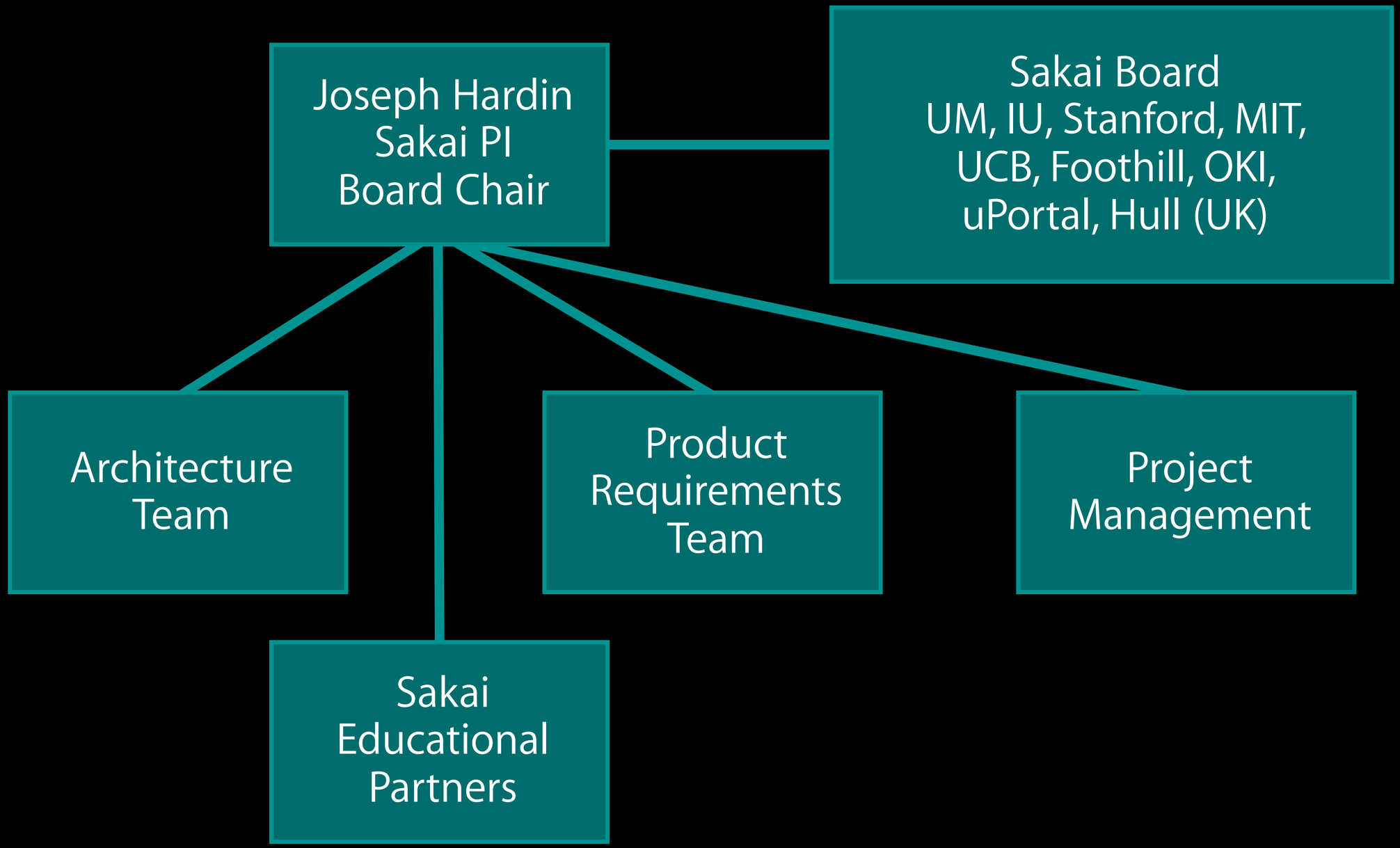
In a way, the Sakai "Project" is just a "blip" in the evolution of an Open Source CLE

The Sakai Community

Close coordination for two years to quickly build the critical mass for open source enterprise Collaborative Learning Environment

http://developer.apple.com/wwdc2005/

Sakai Organization



Sakai Educational Partners—Feb 1, 2005

Arizona State University
Boston University School of Management
Brown University
Carleton College
Carnegie Foundation for Advancement of Teaching
Carnegie Mellon University
Coastline Community College
Columbia University
Community College of Southern Nevada
Cornell University
Dartmouth College
Florida Community College/Jacksonville
Foothill-De Anza Community College
Franklin University
Georgetown University
Harvard University
Johns Hopkins University
Lubeck University of Applied Sciences
Maricopa County Community College
Monash University
Nagoya University
New York University
Northeastern University
North-West University (SA)
Northwestern University
Ohio State University
Portland State University
Princeton University
Roskilde University (Denmark)
Rutgers University
Simon Fraser University
State University of New York
Stockholm University
SURF/University of Amsterdam
Tufts University
Universidad Politecnica de Valencia (Spain)
Universitat de Lleida (Spain)
University of Arizona
University of California Berkeley
University of California, Davis
University of California, Los Angeles
University of California, Merced
University of California, Santa Barbara
University of Cambridge, CARET
University of Cape Town, SA
University of Colorado at Boulder
University of Delaware
University of Hawaii
University of Hull
University of Illinois at Urbana-Champaign
University of Melbourne, Australia
University of Minnesota
University of Missouri
University of Nebraska
University of Oklahoma
University of Texas at Austin
University of Toronto, Knowledge Media Design Institute
University of Virginia
University of Washington
University of Wisconsin, Madison
Virginia Polytechnic Institute/University
Whitman College
Yale University

Sakai Commercial Affiliates

embanet
Relief for your e-Learning Headaches™

Sun microsystems

IBM®

UNISYS

the r•smart group

HarvestRoad.

SUNGARD®
SCT • HIGHER EDUCATION

UNICON

The Sakai Educational Community License is BSD-like and allows complete flexibility in terms of the creation of and licensing of derivative works.

This allows different commercial companies to interact in different ways without any limitations imposed by license.

Sakai Meetings

- Provide a forum for the core and the SEPP to interact and for the SEPP members to interact with one another
  - June 2004—Denver Colorado (180) (Members only)
  - December 2004—New Orleans (200+) (Members only)
  - June 8–14—Baltimore (400+ expected)
    - Community Source Week
    - uPortal, Sakai, OSPI
  - December TBD—Austin, TX (Public)

Sakai's Future

- Initial grant ends December 2005
- Transition to Community Source
  - The SEPP is renamed "Sakai" (1-2 Million/year)
  - Governance is merit-based (like Apache)
  - Core elements of Sakai software are pretty stable
  - Small Community funded team (~10) to keep the core maintained and slowly evolving
  - Most new development will be done outside of the core
  - Significant continued in-kind resources Michigan, Indiana, Yale, Foothill, Stanford, and Berkeley

The Sakai Product

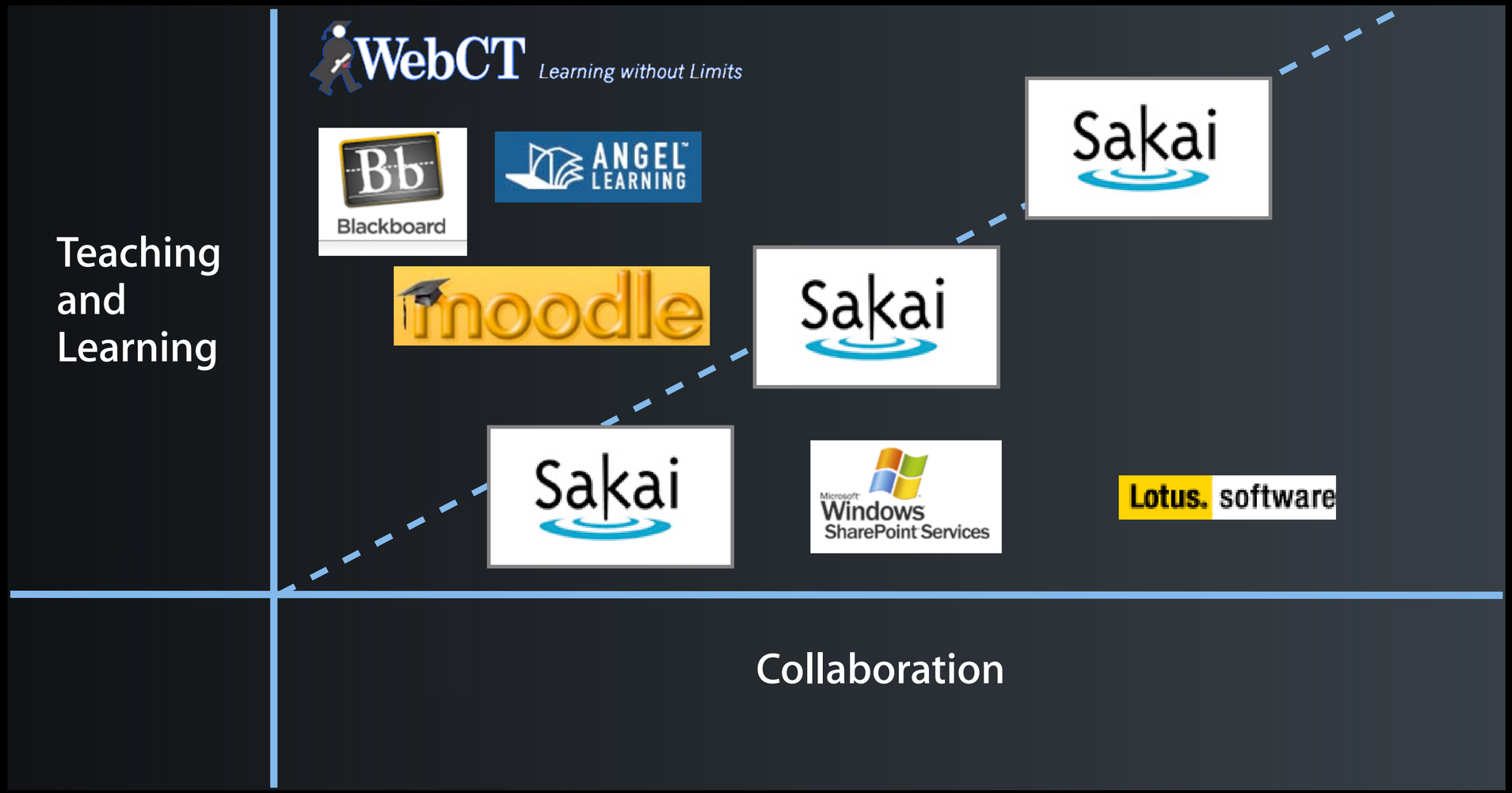
A Collaborative Learning Environment—

Suitable for use in teaching and learning, research collaboration, and ad hoc group communication

http://developer.apple.com/wwdc2005/

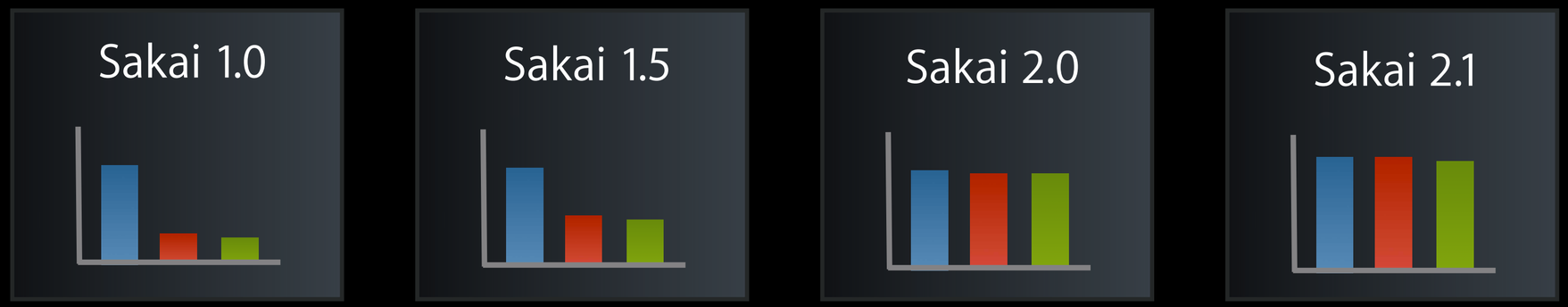
Placing the Sakai Product

A Collaboration and Learning Environment



Sakai Releases

Enterprise Quality Teaching and Learning and Collaboration

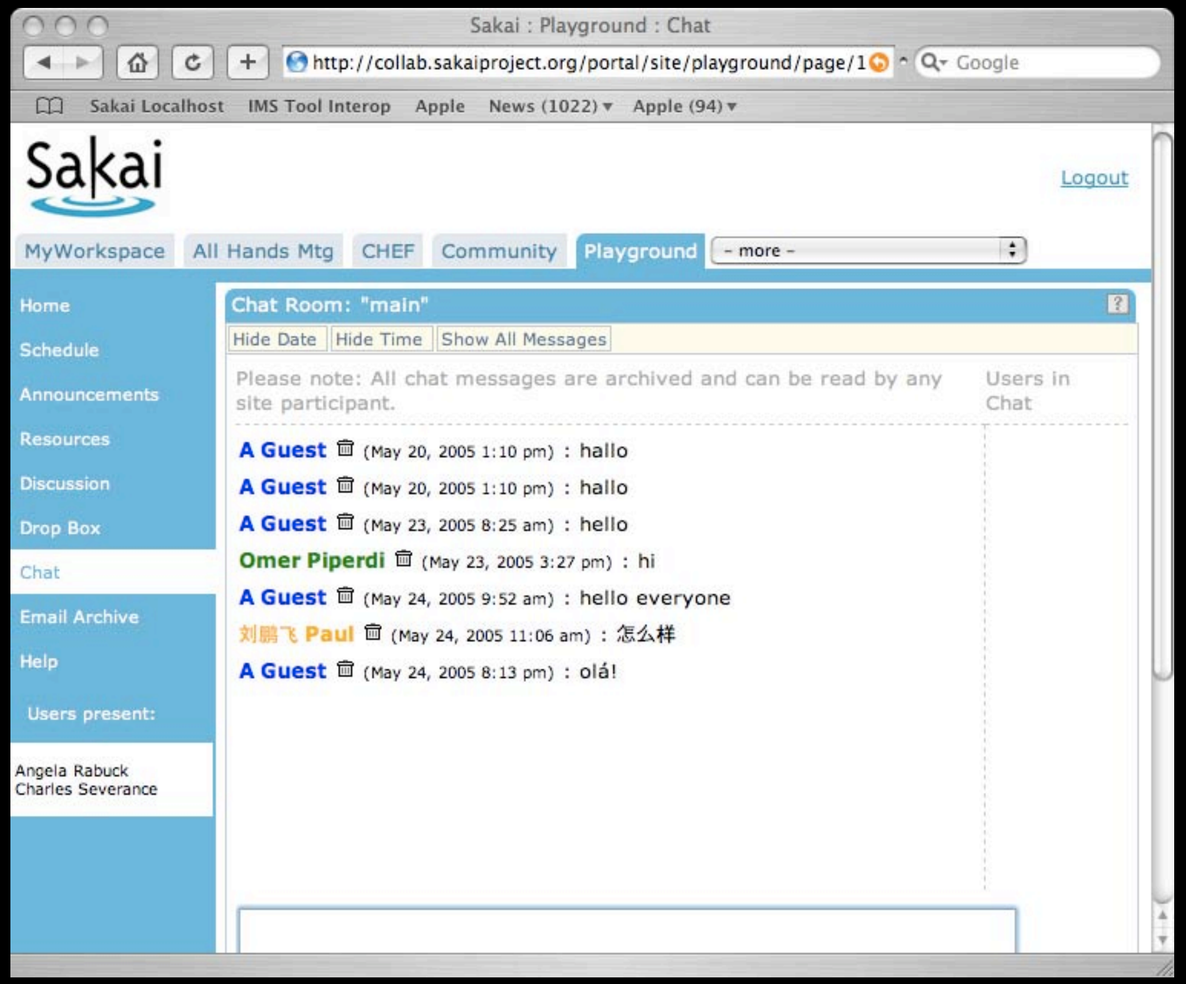


Collaboration

Teaching and Learning

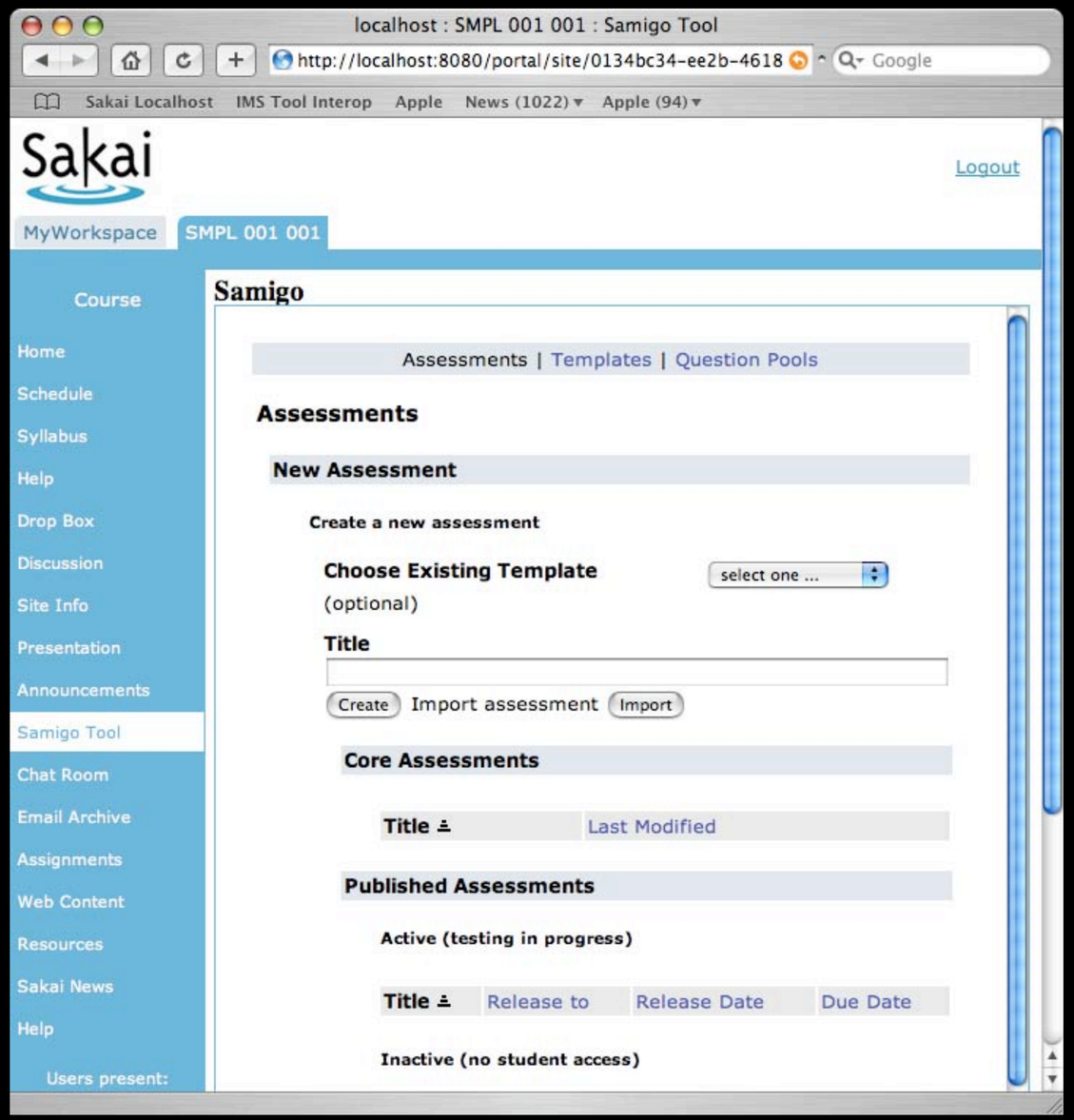
Enterprise "Suitability"

Sakai 1.0 Tools



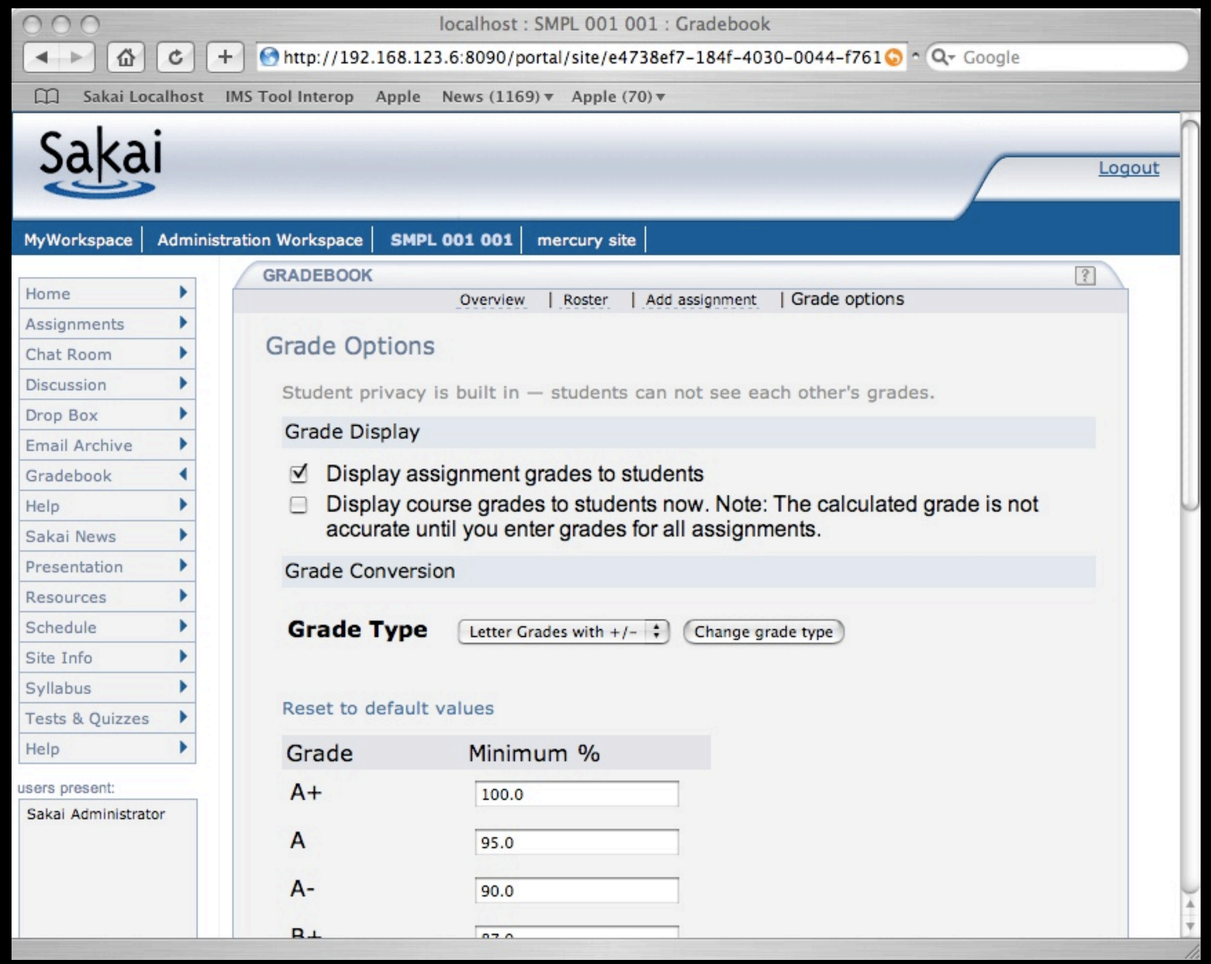
- Announcements
- Assignments
- Chat Room
- Threaded Discussion
- Drop Box
- Email Archive
- Message Of The Day
- News/RSS
- Preferences
- Resources
- Schedule
- Web Content
- Worksite Set-up
- WebDAV

Sakai 1.5 Tools



- Samigo—QTI compliant assessment engine (Stanford)
- Syllabus Tool (Indiana)
- Context Sensitive Help (Indiana)
- Presentation Tool (SEPP)
- Portfolio Tool—OSPI (R-Smart) (separate release)

Sakai 2.0 Tools

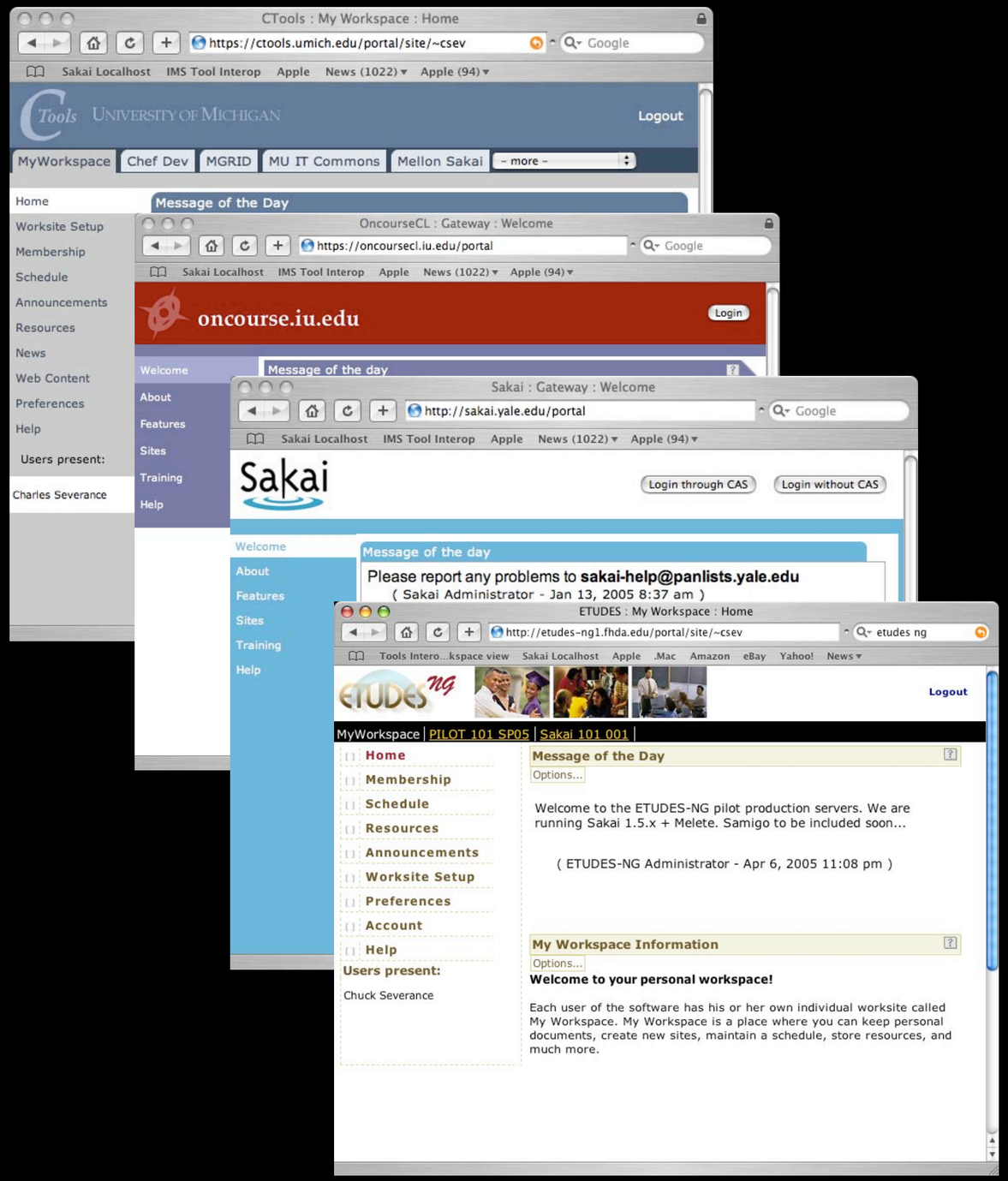


- Completely re-written Kernel (UM / MIT)
- Melete—Online classroom—lesson editor (Foothill)
- Profile Tool (Indiana)
- Grade Book (UC Berkeley/MIT)

Demo

Setting up a Worksite for Collaborative Group Projects

http://developer.apple.com/wwdc2005/



Sakai in Production

- University of Michigan
  - September 2004
- Indiana University
  - January 2005
- Yale University
  - January 2005
- Etudes/Foothill
  - April 2005

Sakai Adoption Plans

- Boston University School of Management
- Carleton
- Columbia University
- Johns Hopkins University
- Lueck University of Applied Sciences, Germany
- Massachusetts Institute of Technology
- Northwestern University
- Stanford University
- University of California, Berkeley
- University of California, Los Angeles
- University of California, Merced
- University of Cape Town, SA
- University Fernando Pessoa, Portugal
- University of Lleida, Spain
- University of Missouri
- University of Virginia
- Whitman College

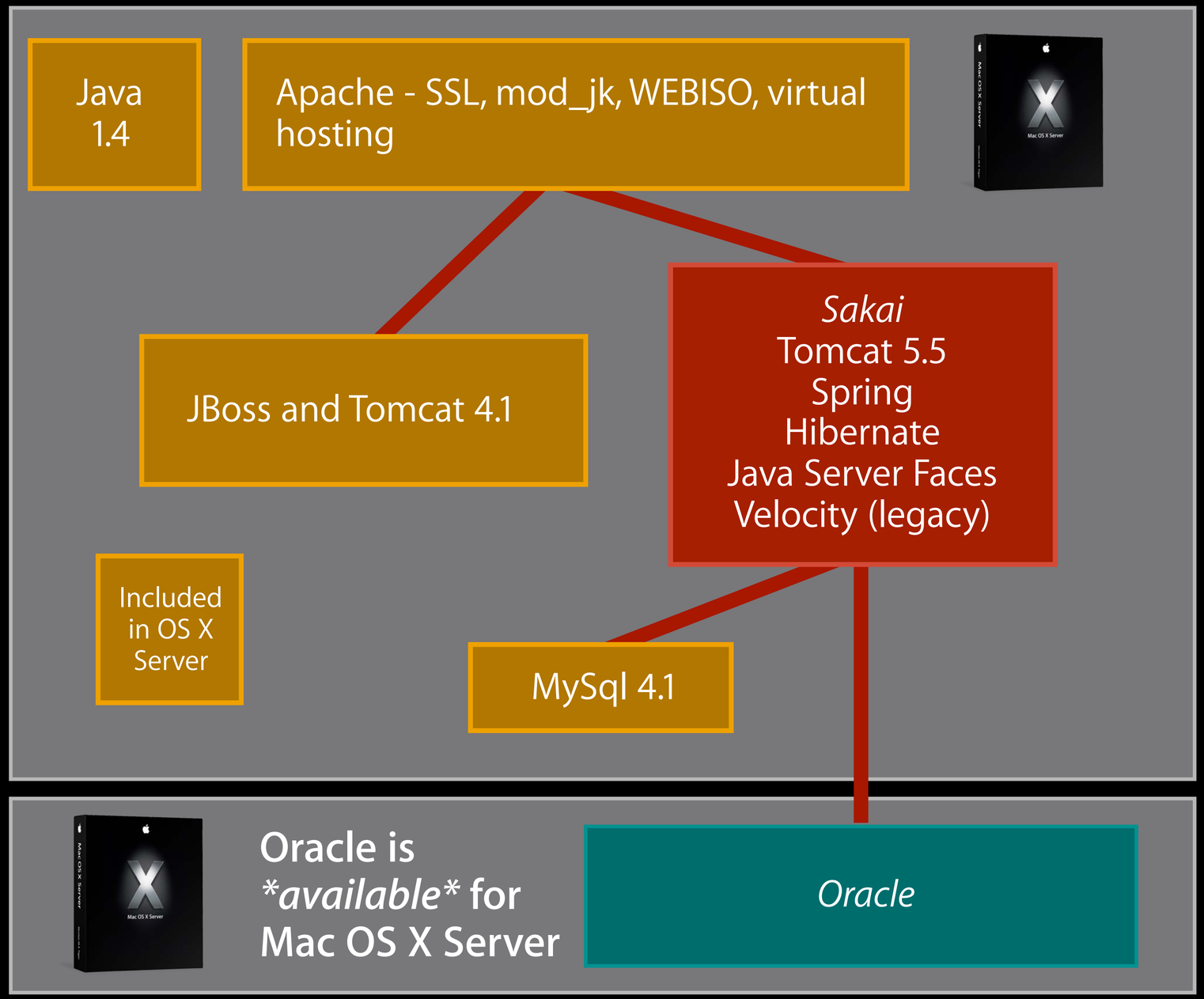
Type “Sakai Adoption Plans” into Google

The Sakai Framework

The need to satisfy the often conflicting goals of ease of use, ease of expansion, configuration flexibility, environmental portability and rock-solid production reliability suitable for enterprise deployment.

http://developer.apple.com/wwdc2005/

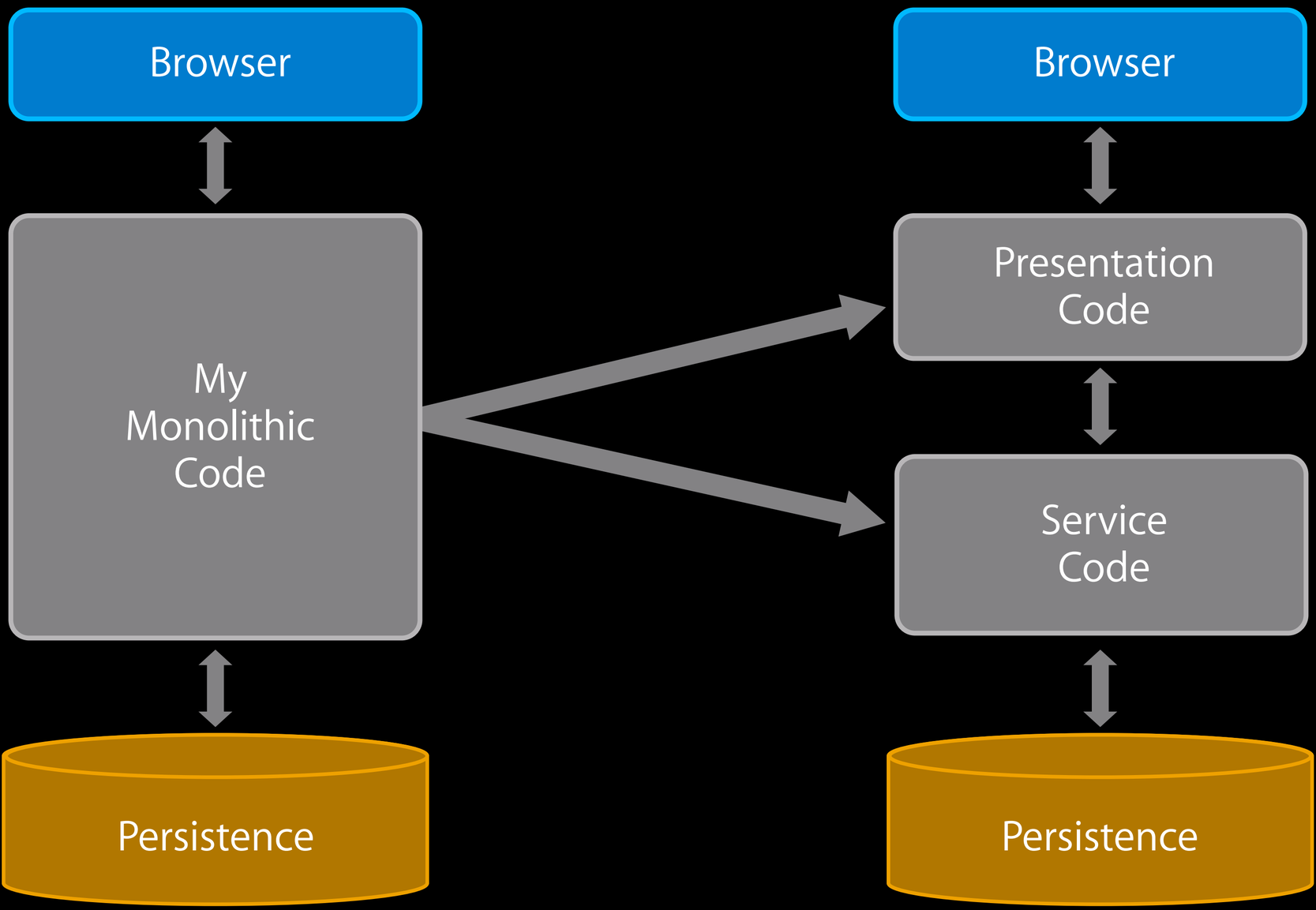
Sakai Foundational Technologies



Sakai consists of technologies chosen to be common in Java Enterprise Environments.

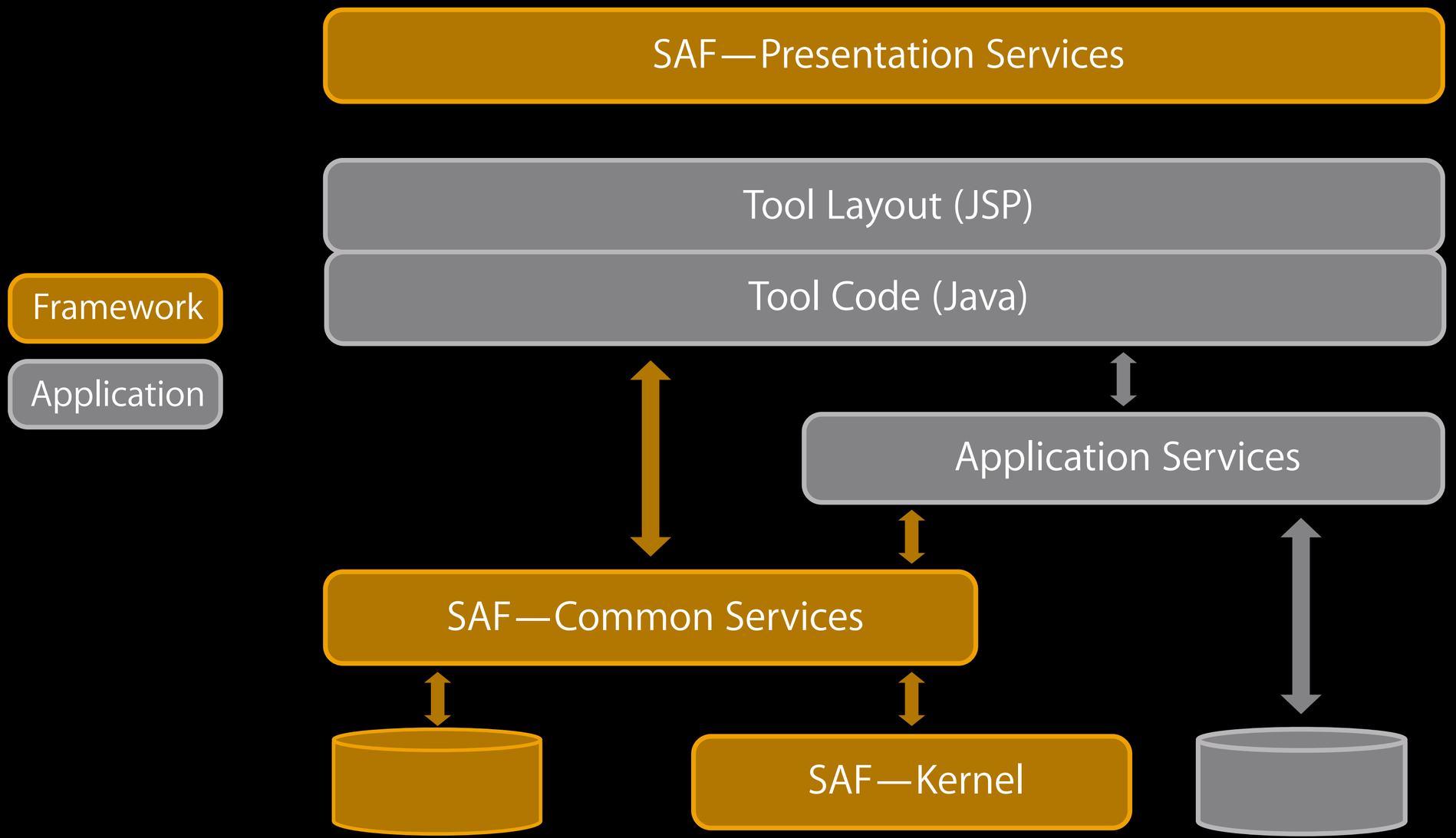
Sakai requires Tomcat 5.x but can make use of all of the open source elements included in Mac OS X Server.

Service Oriented Architecture



Service Interface (i.e. API)

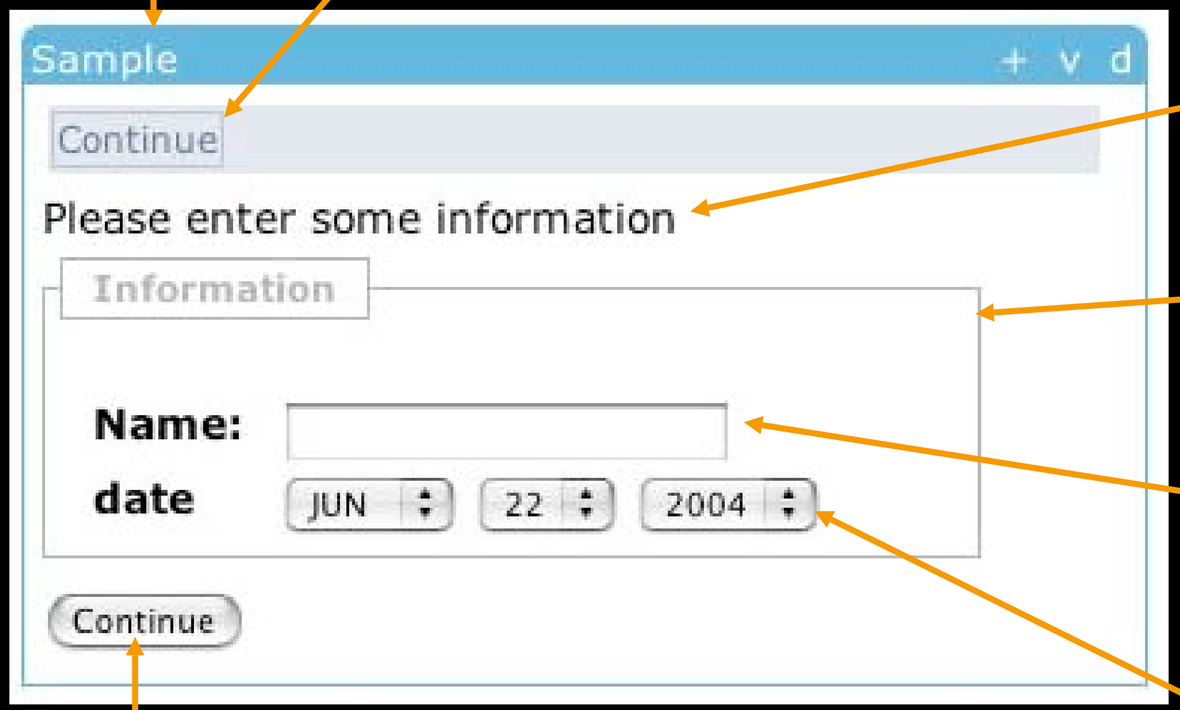
Sakai Application Framework



Sakai Presentation Services

```
<sakai:view_container title="#{msgs.sample_title}">
```

```
<sakai:tool_bar>    <sakai:tool_bar_item/>    </sakai:tool_bar>
```




```
<sakai:instruction_message
value="#{msgs.sample_one_instructions}" />
```

```
<sakai:group_box
title="#{msgs.sample_one_groupbox}">
```

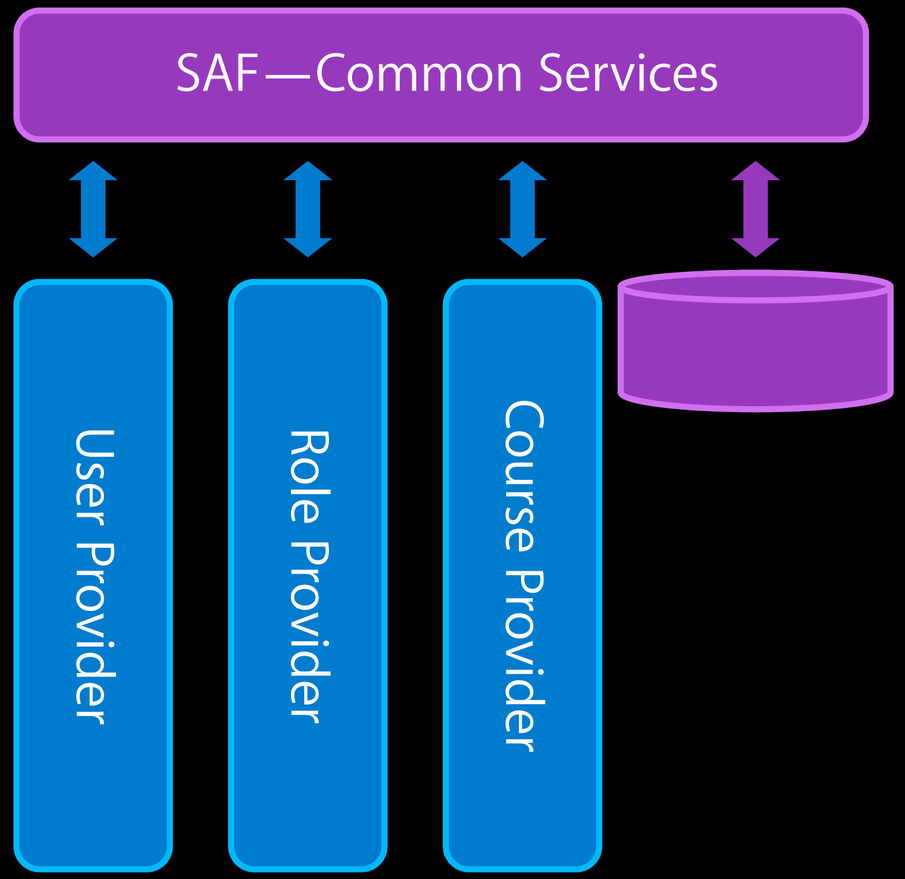
```
<h:inputText
value="#{MyTool.userName}" />
```

```
<sakai:date_input
value="#{MyTool.date}" />
```

```
<sakai:button_bar>
   <sakai:button_bar_item      action="#
{MyTool.processActionDoIt} value="#
{msgs.sample_one_cmd_go}" />
</sakai:button_bar>
```

Sakai Service Providers

- Common services are localized using Plug-ins
  - UserDirectoryProvider
  - RealmProvider
  - CourseManagementProvider
- These will be expanded
  - OKI OSID Based Providers
- Plug-ins do not replace the persistence, they are consulted in order to populate Sakai structures



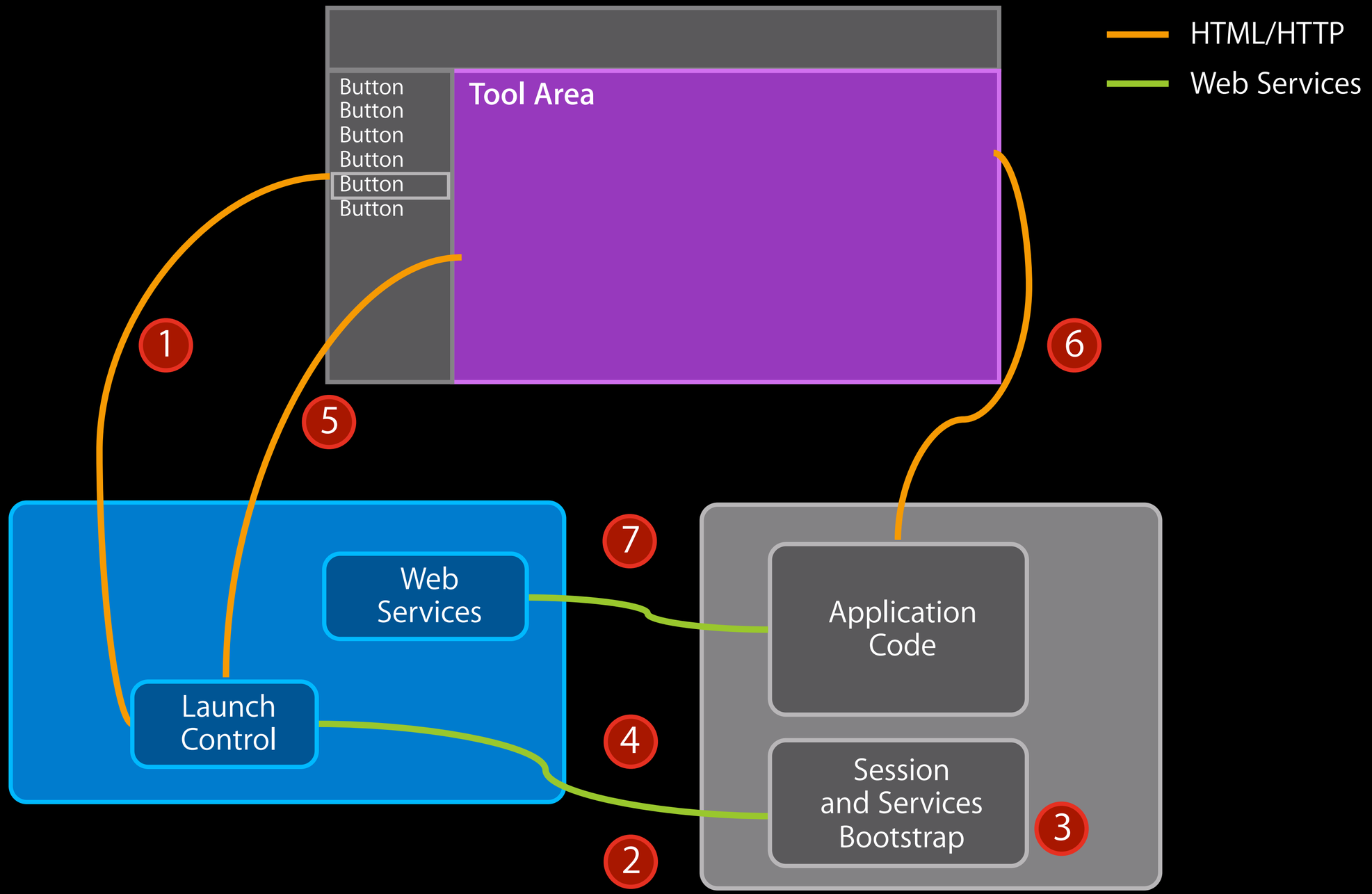
Sakai and OKI

- OKI is one of the founding partners of the Sakai project
- The Sakai Framework's use of OSIDs focuses on using OSIDs to integrate enterprise information into Sakai—this is expected for the 2.1 release
- The Sakai Common APIs are designed based on adopting the design principles and terminology of the OSIDs (Agent, Asset, etc). This is done so that the Sakai APIs and OSIDs will remain in close alignment and each can benefit from innovations of the other.
- A number of tools including Samigo and Presentation use OSID APIs internally in Sakai 1.5 and 2.0

IMS Tool Portability Group

- To work on ‘interoperability’ between and among CMS’s/CLE’s
- Focus is on making tools portable between systems (Sakai, WebCT, and Blackboard)
- Established to further the discussion with commercial and other CMS/CLE providers
- Will use web services and IFRAMES
- Will show working demonstration at the June 2005 Alt-I-lab with Samigo in Sakai, WebCT, and Blackboard

Sakai, IMS, and Web Services



Summary or Why You Cared

- Education Institutions and Customers
  - Sakai provides FOSS enterprise-quality software for teaching, and learning
  - By adopting Sakai, institutions gain control over their own destiny w.r.t. teaching and learning on their campuses
- Commercial and Open/Community Source Developers
  - Sakai's licensing is very commercial-friendly—many opportunities to add value to Sakai profitably
  - Sakai's founding principles are to encourage commercial affiliates and support those affiliates
- Content Providers
  - Sakai is taking a leadership role and working with OKI and IMS to develop cross-LMS standards and provide a reference implementation for those standards
  - Allows content providers to build to a single standard and deploy across Sakai, WebCT, Moodle, Blackboard, etc…

Sakai and Apple

- Among the developer team, 70% develop on Apple systems
  - More dev-QA is done on Apple OS X than any other system :)
- Sakai's internal collaboration server runs on Mac OS X Server
  - collab.sakaiproject.org
- Advantages of Mac OS X and Xserve when running Sakai
  - Simple operating system maintenance (patches, etc)
  - Java pre-installed and kept up to date
  - Probably the ideal platform for small installations where there is not a dedicated system administrator

Sakai: More Information and Next Steps

- Main site: www.sakaiproject.org
  - Bugs: bugs.sakaiproject.org
- Sakai-wide collaboration area
  - collab.sakaiproject.org
  - sakai-dev@sakaiproject.org
  - sakai-user@sakaiproject.org

- MacLearningEnvironments.org
  - Integrating Apple technologies into new Learning Environments
  - Open and Community Source Learning Infrastructure Projects
  - Mac OS X Server implementations and deployments of Sakai
  - Community Built on Sakai

Open Knowledge Initiative

Jeff Merriman, Chuck Shubert, and Geoff Hulette

http://developer.apple.com/wwdc2005/

The Open Knowledge Initiative

- Initially funded through a grant from the Andrew W. Mellon Foundation
- Institutional Collaborators:
  - Cambridge University
  - Dartmouth College
  - Indiana University
  - MIT (Project Lead)
  - North Carolina State University
  - Stanford University
  - University of Michigan
  - University of Pennsylvania
  - University of Wisconsin
- Partnership with the IMS Global Learning Consortium

Open Service Interface Definitions (OSIDs)

- Service Oriented Architecture Specifications for eLearning
- Interface specification for Plug-in interoperability
  - Reduce cost and effort for custom integration
  - Future-proof against changing technologies
  - Increase opportunities for Collaboration
  - Increase Mobility of applications among enterprise infrastructures
  - Enable Marketplace of Pre-integrated software components
- Java versions released in Spring 2003, Currently Ver. 2.0
- Objective-C versions due in July
- Version 3.0 due later this year

So, What's an OSID?

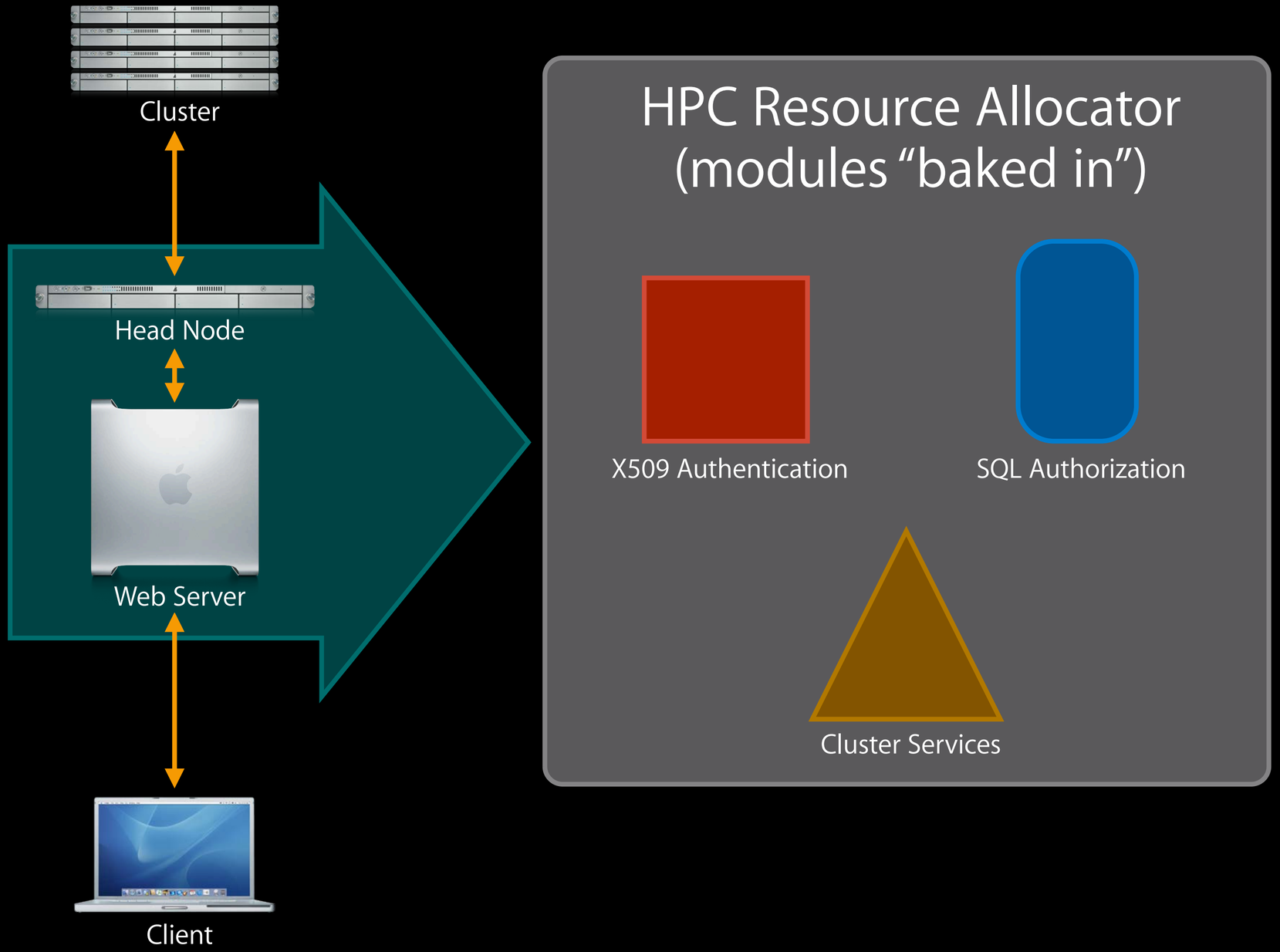
Introduction through demonstration

http://developer.apple.com/wwdc2005/

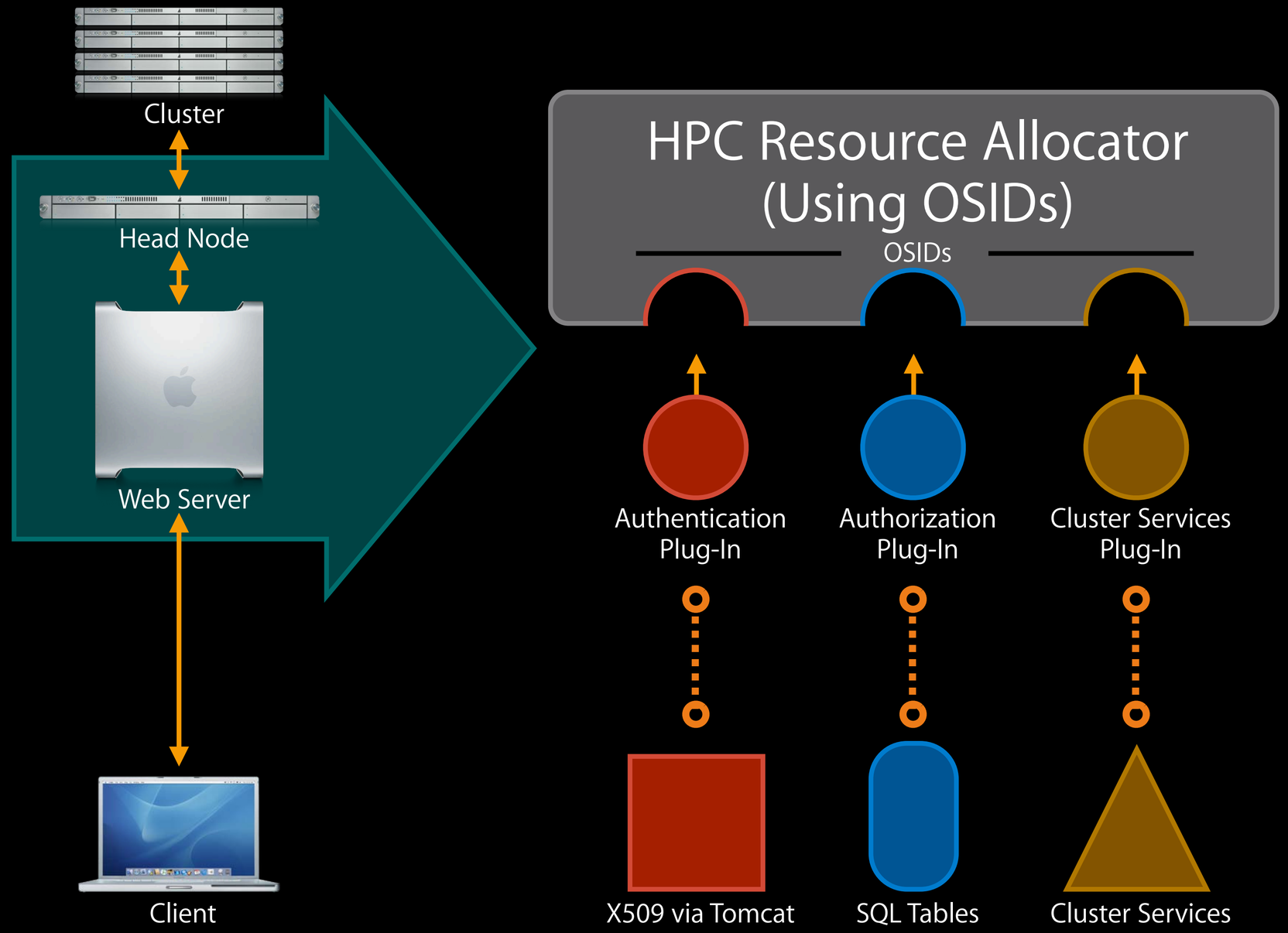
Case Study #1

- High Performance Computing
  - Integration with the Enterprise

HPC/Enterprise Integration—Monolithic



Using Service Interface Definitions



Demonstration

http://developer.apple.com/wwdc2005/

The OSIDs

Definitions and Technology

http://developer.apple.com/wwdc2005/

Current OSIDs

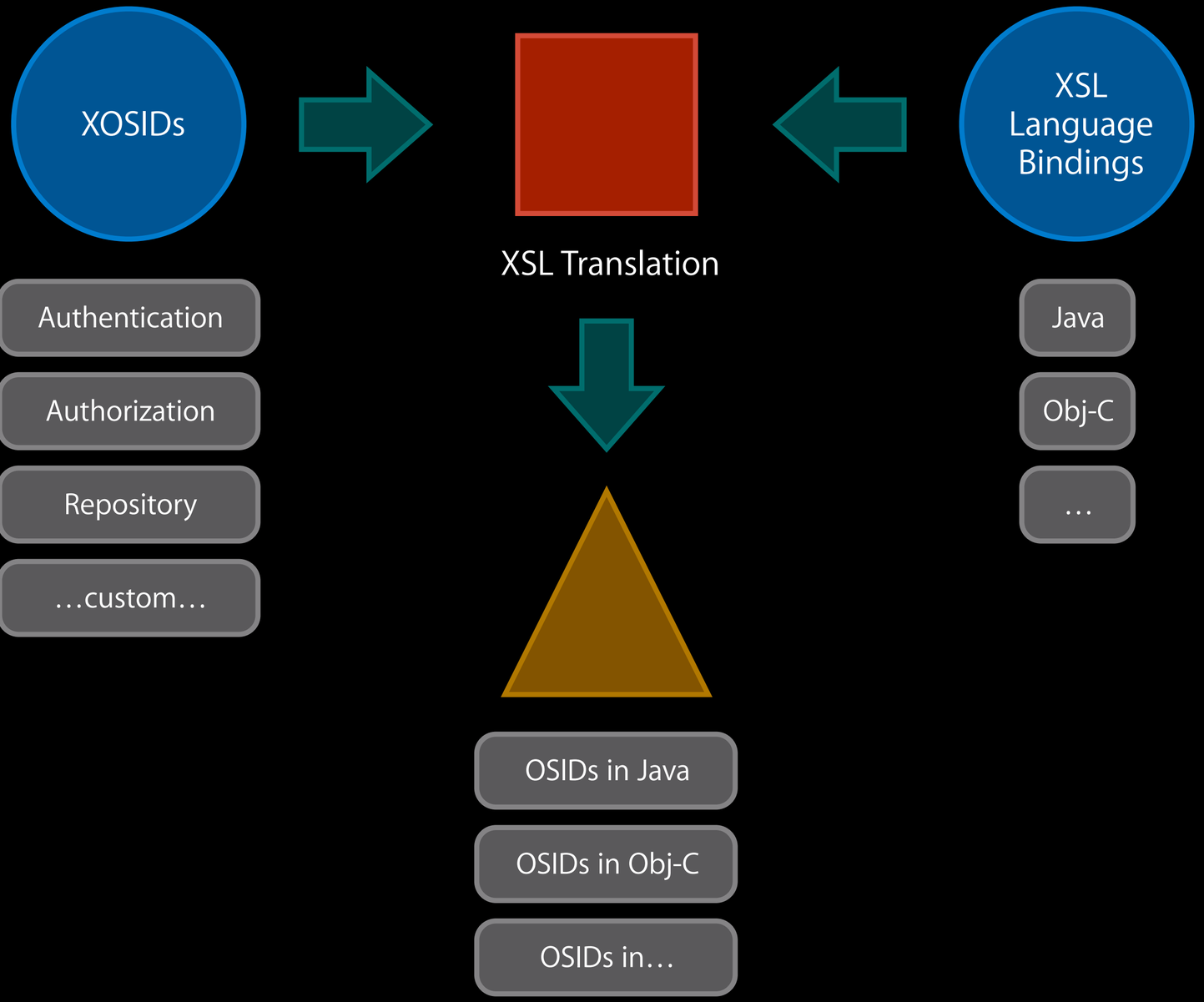
Common Services

- Authentication
- Authorization
- SQL
- Logging
- Filing
- Dictionary
- Hierarchy
- Agent
- Shared
- ID
- User Messaging
- Scheduling
- Workflow

Educational Services

- Repository
- Course Management
- Grading
- Assessment

Multiple Technology Bindings



Objective-C OSIDs

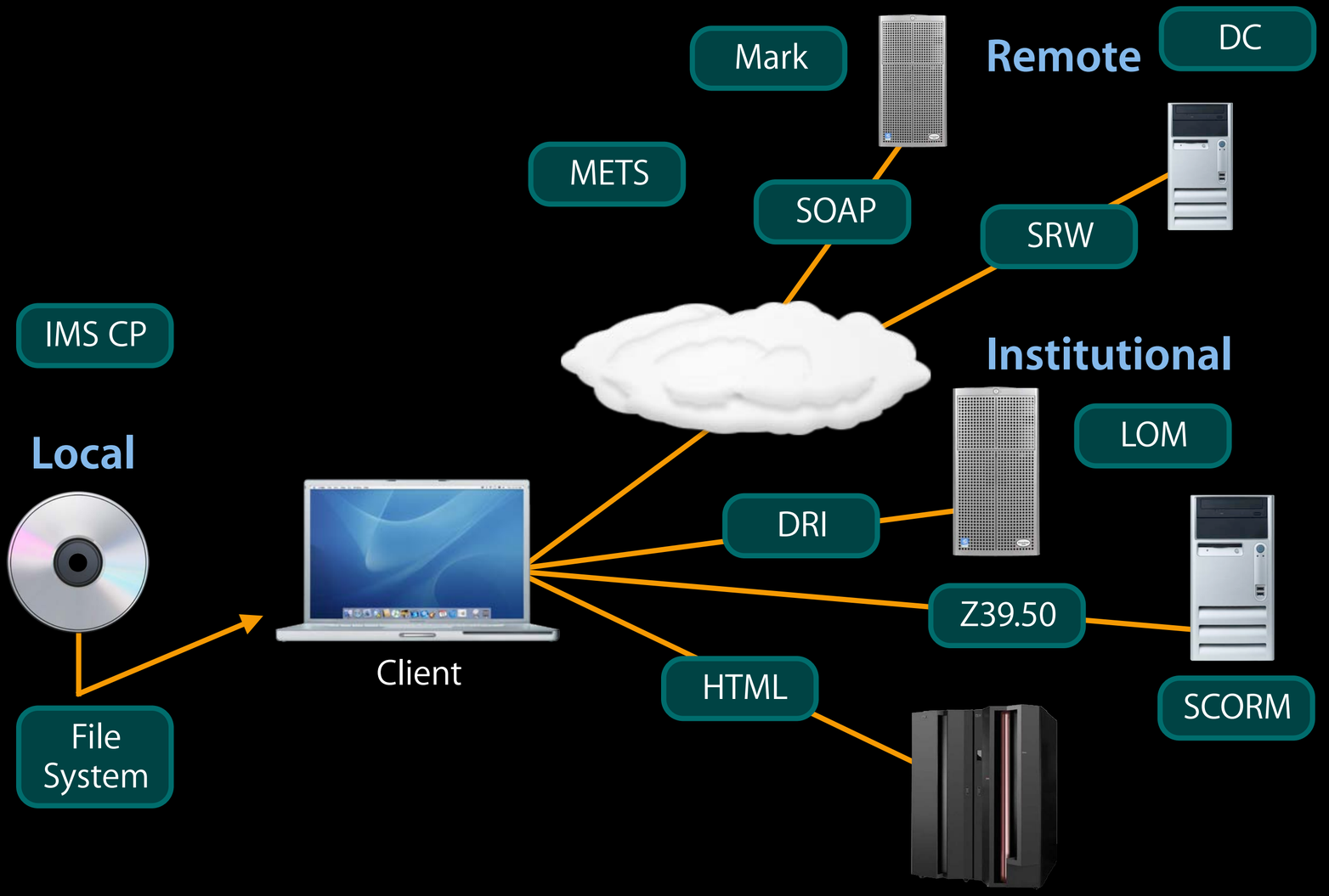
- OSIDs (Framework)
  - Managers
  - General classes (Context, Exception)
  - Loader
- OSID Implementation (separate Framework)
  - Manager subclasses
  - Supporting classes

OSID Case Study #2

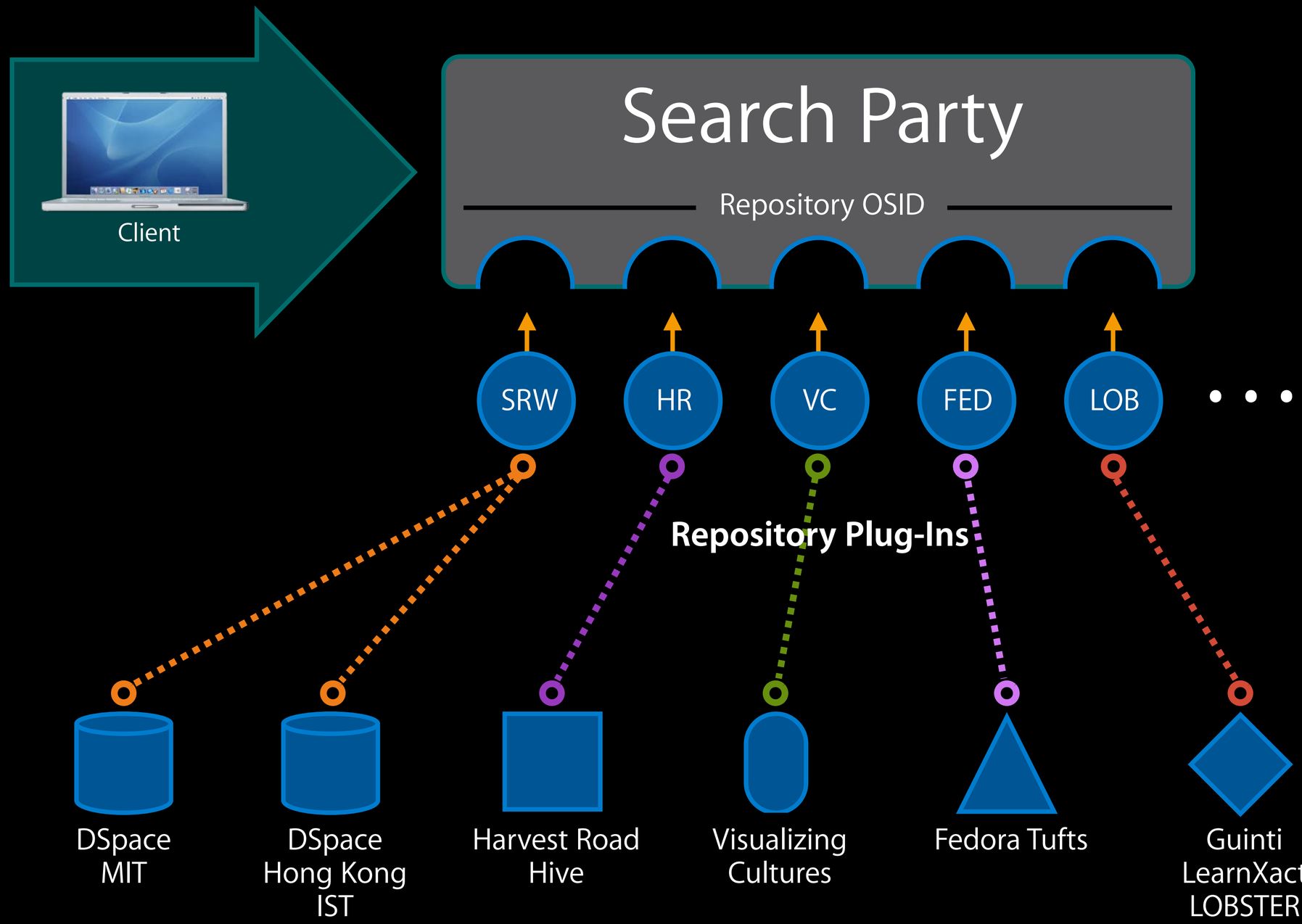
A Cocoa App-based Federated Search of Heterogeneous Digital Repositories

http://developer.apple.com/wwdc2005/

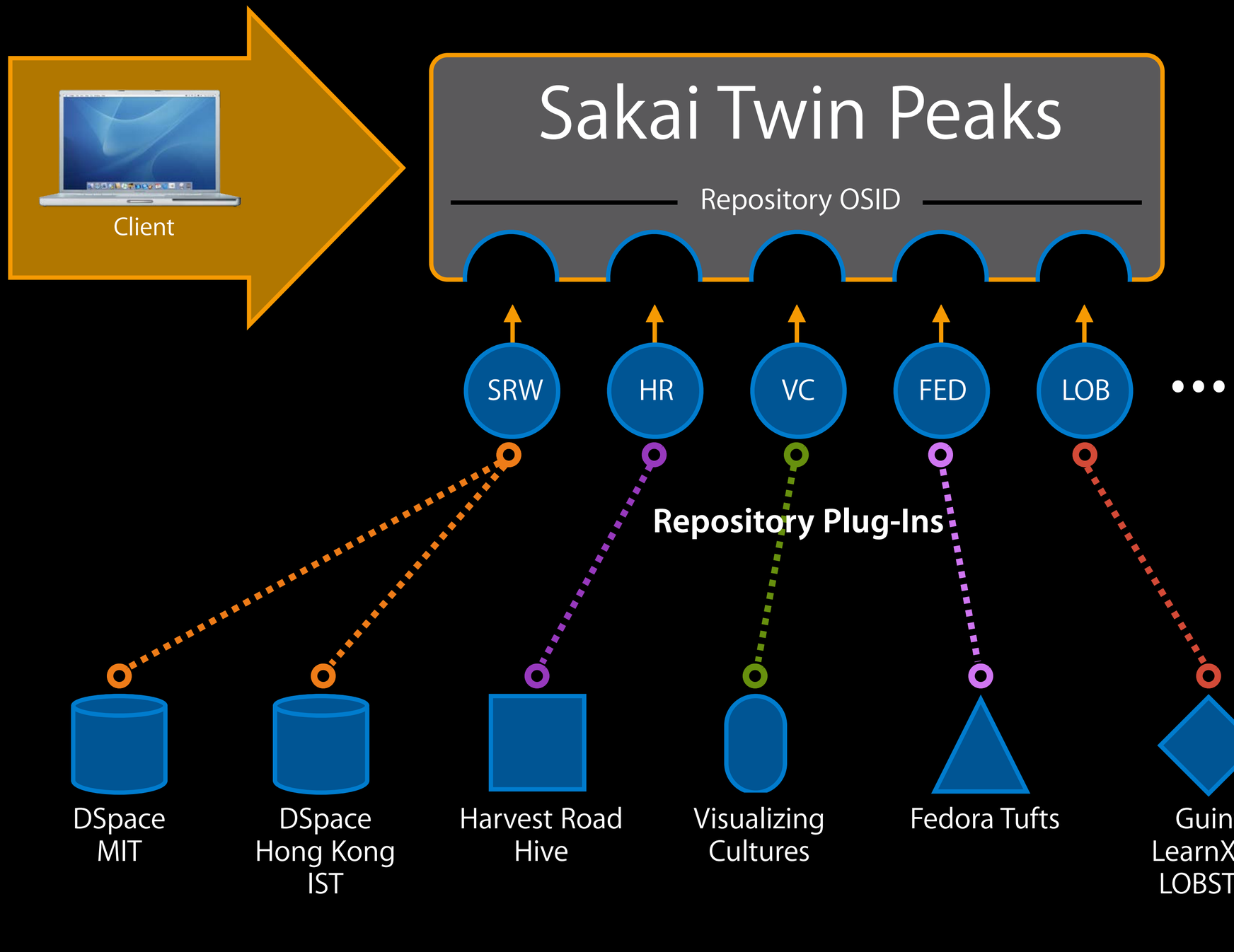
Complex World of Repositories



App with Repository OSID Plug-Ins



App with Repository OSID Plug-Ins



Demonstration of Search Party

http://developer.apple.com/wwdc2005/

Why Adopt OSIDs? Who Has Already?

Commercial and Non-Commercial

http://developer.apple.com/wwdc2005/

What OSIDs do for Commercial and Non-Commercial Product Developers

- Provide a clear SOA interface specification
- Provide a way to create factored products
- Provide a way to use existing customer services
- Provide the customer with an upgrade path
- Provide a way to integrate with other products
- Minimize coupling between components
- Encourage writing for code reuse

What OSIDs do for Institutions

- Provide a standard Service Oriented mechanism for eLearning integration
- Provide a way to scope and cost integration activity
- Provide a way to scope and cost development activity
- Provide a way to generate vendor requirements
  - “Your tool must use the abc OSID”
  - “Your service must implement the xyz OSID”
- Open a path for multiple vendor product use

OSID Adoption/Activity—Commercial

- Guinti Interactive Labs—LearneXact LOBSTER/Packager
- Harvest Road—Hive/Hive Explorer
- Mac Learning Environments—SearchParty
- Sun Microsystems—Identity Services
- Cisco GLN
- Sentient Learning
- ARTStor/JStor

OSID Adoption/Activity—NonCommercial

- Sakai CLE—UMich/Indiana/Stanford/MIT etc…
- Visual Understanding Environment (VUE)—Tufts University
- Narravision—MIT
- Segue LCMS—Middlebury College
- M:Media—MIT
- LionShare—Penn State University
- Fedora—University of Virginia
- DSpace—MIT
- HPC/Enterprise Services—MIT
- CeLeBrAte—European Schoolnet
- Edusource Canada (Repository Brokerage)

OSIDs: Where to Get Them and Learn More

- O.K.I. Project Site
  - http://www.okiproject.org
- IMS Global Learning Consortium
  - http://www.imsglobal.org
- Mac Learning Environments Community
  - http://MacLearningEnvironments.org

The Learning Enterprise is Now Open

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Sakai™

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Q&A

http://developer.apple.com/wwdc2005/

WWDC2005

Worldwide Developers Conference